UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/737,783	12/15/2000	Perry Wang	42390P9634	2478

7590 05/18/2004

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP
Seventh Floor
12400 Wilshire Boulevard
Los Angeles, CA 90025-1026

EXAMINER	
HARKNESS, CHARLES A	

ART UNIT	PAPER NUMBER
2183	10

DATE MAILED: 05/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/737,783	WANG ET AL	
	Examiner	Art Unit	
	Charles A Harkness	2183	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 March 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. In view of Applicant's amendment to the title, the previous objection has been withdrawn.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-16 are rejected under 35 U.S.C. 102(e) as being anticipated by Gschwind et al, U.S. Patent Number 6,513,109 (herein referred to as Gschwind).

3. Referring to claim 1 Gschwind has taught a microprocessor comprising:

a plurality of dynamic pipeline stages including at least one predicated instruction, which includes a plurality of guarding predicates, and at least one dependent instruction whose operation depends upon the at least one predicated instruction (Gschwind column 2 lines 64-67, figures 2-3, column 16 lines 8-11, column 14 lines 19-26);

a plurality of execution units to execute the dependent instruction (Gschwind figure 4 numbers 340, 345, 350);

a reorder buffer (Gschwind column 9 lines 55-58);

a plurality of register renaming units to rename at least one register corresponding to the predicated instruction (Gschwind figure 4 number 330), wherein renaming of the at least one register is not to be performed until the dependent instruction is executed (Gschwind figure 4

number 330, column 2 lines 9-23; out of order execution; column 6 lines 33-51, figure 11, predicting future register names and then later verifying the names – the verification is done after the execution, thus allowing the execution of the instruction without stalling for renaming, and then verifying before the instructions are retired);

a plurality of reservation stations wherein the register renaming unit, the reorder buffer, the plurality of execution units and the plurality of reservation stations are coupled to at least one of the plurality of dynamic pipeline stages (Gschwind figure 4 number 335); and

an augmented register alias table (Gschwind column 10 lines 5-7, figure 10).

4. Referring to claim 2 Gschwind has taught wherein the register renaming unit renames each one of a plurality of source registers of the pipeline instruction and renames a destination register to a new physical register (Gschwind column 8 lines 25-43 figure 10).

5. Referring to claim 3 Gschwind has taught wherein the augmented register alias table includes a plurality of lines, and wherein each one of the plurality of lines includes a plurality of renamed destination registers (Gschwind figures 10-11, column 8 lines 25-43, column 9 line 65-column 10 line 32).

6. Referring to claim 4 Gschwind has taught wherein each one of a plurality of select-uops has a plurality of source operands wherein each one of the plurality of source operands corresponds to a physical register identifier (Gschwind figures 10-11, column 8 lines 25-43, column 9 line 65-column 10 line 32).

7. Referring to claim 5 Gschwind has taught wherein the plurality of source operands comprises a first source operand and a plurality of secondary source operands (Gschwind figure

10, the architected register names, and the future register names, column 9 line 65-column 10 line 32).

8. Referring to claim 6 Gschwind has taught wherein the first source operand includes a default physical register identifier, wherein the default physical register is always valid and available (Gschwind column 15 lines 48-65, column 14 line 46-column 15 line 28; the predicate register is a common register and is used for all predicate instructions and its always available).

9. Referring to claim 7 Gschwind has taught wherein each one of the plurality of secondary source operands includes a plurality of status bits and a physical register identifier (Gschwind figures 10-11, column 8 lines 25-43, column 9 line 65-column 10 line 32, column 22 lines 32-39).

10. Referring to claim 8 Gschwind has taught wherein each one of the plurality status bits has a ready bit and a committed bit (Gschwind column 17 lines 61-67, column 21 lines 7-12).

11. Referring to claim 9 Gschwind has taught a method of processing predicated instructions comprising:

receiving a plurality of predicated instructions assigned to a common defined destination register (Gschwind column 15 lines 48-65, column 14 line 46-column 15 line 28; the predicate register is a common register) and wherein at least one of the plurality of predicated instructions is out of order in an dynamic pipeline (Gschwind column 9 lines 55-58);

renaming the destination register for each one of the plurality of predicated instructions (Gschwind figures 10-11, column 8 lines 25-43, column 9 line 65-column 10 line 32);

assigning the corresponding renamed destination register for each one of the plurality of predicated instructions with a corresponding predicate register to corresponding ones of the a

plurality of source operands of a select-uop (Gschwind figures 10-11, column 8 lines 25-43, column 9 line 65-column 10 line 32);

determining a valid predicate in the source operands of the select-uop(column 22 lines 32-39, column 15 line 66-column 16 line 7);

selecting the register corresponding to the select-uop that corresponds to the valid predicate (Gschwind figures 10-11, column 8 lines 25-43, column 9 line 65-column 10 line 32, column 15 line 66-column 16 line 7);

transferring the data in the selected register to the destination register (Gschwind figures 10-11, column 8 lines 25-43, column 9 line 65-column 10 line 32); and

executing a consumer instruction before renaming the destination register of each of the plurality of predicated instructions (Gschwind figure 4 number 330, column 2 lines 9-23; out of order execution; column 6 lines 33-51, figure 11, predicting future register names and then later verifying the names – the verification is done after the execution, thus allowing the execution of the instruction without stalling for renaming, and then verifying before the instructions are retired), wherein the consumer instruction uses the data from the destination register of the corresponding select-uop (Gschwind column 14 lines 19-26).

12. Referring to claim 10 Gschwind has taught wherein the each one of the plurality of select-pops has a plurality of source operands wherein each one of the plurality of source operands corresponds to a physical register identifier (Gschwind figures 10-11, column 8 lines 25-43, column 9 line 65-column 10 line 32).

13. Referring to claim 11 Gschwind has taught wherein the plurality of source operands comprises a first source operand and a plurality of secondary source operands (Gschwind figures 10-11, column 8 lines 25-43, column 9 line 65-column 10 line 32).

14. Referring to claim 12 Gschwind has taught wherein the first source operand includes a default physical register identifier, wherein the default physical register is always valid and available (Gschwind column 15 lines 48-65, column 14 line 46-column 15 line 28; the predicate register is a common register and is used for all predicate instructions and its always available).

15. Referring to claim 13 Gschwind has taught wherein each one of the plurality of secondary source operands includes a plurality of status bits and a physical register identifier (Gschwind figures 10-11, column 8 lines 25-43, column 9 line 65-column 10 line 32, column 22 lines 32-39).

16. Referring to claim 14 Gschwind has taught a computer system comprising:

a processor, wherein the processor includes:

a plurality of dynamic pipeline stages including at least one predicated instruction, which includes a plurality of guarding predicates, and at least one dependent instruction whose operation depends upon the at least one predicated instruction (Gschwind column 2 lines 64-67, figures 2-3, column 16 lines 8-11, column 14 lines 19-26);

a plurality of execution units to execute the dependent instruction (Gschwind figure 4 numbers 340, 345, 350);

a reorder buffer (Gschwind column 9 lines 55-58);

a plurality of register renaming units to rename at least one register corresponding to the predicated instruction (Gschwind figure 4 number 330), wherein renaming of the at least one

register is not to be performed until the dependent instruction is executed (Gschwind figure 4 number 330, column 2 lines 9-23; out of order execution; column 6 lines 33-51, figure 11, predicting future register names and then later verifying the names – the verification is done after the execution, thus allowing the execution of the instruction without stalling for renaming, and then verifying before the instructions are retired);

a plurality of reservation stations wherein the register renaming unit, the reorder buffer, the plurality of execution units and the plurality of reservation stations are coupled to at least one of the plurality of dynamic pipeline stages (Gschwind figure 4 number 335); and

an augmented register alias table (Gschwind column 10 lines 5-7);

a system bus (Gschwind figure 4 the system bus would be the bus between the memory 305 and the cache systems);

a computer memory system (Gschwind 4 number 305);

an input/output device (Gschwind figure 4; most of the logical units are input and output devices, including the memory 305 and the data cache, the future register file, the execution units);

wherein the system bus is coupled to the processor, the computer memory system and the input/output device.

17. Referring to claim 15 Gschwind has taught wherein, the augmented register alias table includes a plurality of lines, and wherein each one of the plurality of lines includes a plurality of renamed destination registers (Gschwind figures 10-11, column 8 lines 25-43, column 9 line 65-column 10 line 32).

18. Referring to claim 16 Gschwind has taught wherein, the register renaming unit renames each one of the plurality of source registers of the pipeline instruction and renames the destination register to a new physical register (Gschwind figures 10-11, column 8 lines 25-43, column 9 line 65-column 10 line 32).

Response to Arguments

19. Applicant's arguments with respect to claims 1-16 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles A Harkness whose telephone number is 703-305-7579. The examiner can normally be reached on 8:00 A.M. – 5:30 P.M. with every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Chan can be reached on 703-305-9712. The fax phone numbers for the organization where this application or proceeding is assigned are 703-746-7239 for regular communications and 703-746-7238 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-7579.

Charles Allen Harkness

Examiner

Art Unit 2183

May 14, 2004

EDDIE CHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100